

# COMMUNICATION SYSTEM PROVIDED WITH ERBIUM- DOPED OPTICAL FIBER

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## Abstract of JP4273187

**PURPOSE:** To provide an optical fiber communication system having an Si system amplifier fiber including Ge, Al, and Er at the core. **CONSTITUTION:** This amplifier fiber has Er distribution having an effective relative refractive index difference ( $\Delta n$ ) larger than 0.03, a valid core diameter ( $a$ ) less than  $3.5\mu\text{m}$ , in-core Al concentration which is at least 6mol%, mode area diameter less than  $5\mu\text{m}$  in excitation wavelength, a rated frequency in a range from 1.4 to 2.0 in the excitation wavelength, a cut-off wavelength less than  $1.4\mu\text{m}$ , and a valid diameter less than the valid diameter of Ge distribution. This amplifier fiber has merits having the characteristics of a low amplification threshold value and a low noise. Also, a method for manufacturing an optical fiber generally having characteristics (for example,  $\Delta n > 0.03$ , and high Al concentration) which can not be obtained in a conventional method can be developed. In a special execution example, this method includes a process for partially welding a tubular pre-form before the accumulation of core materials is completed, and the final welding is operated.

